

## DESCRIPTION

## PLANAR ANTENNA AND METHOD FOR DESIGNING THE SAME

This application is a National Stage application of co-pending PCT application No. PCT/JP03/07417 06/11/2003.

## TECHNICAL FIELD

The present invention relates generally to a circularly polarized wave antenna for a microwave band used in satellite broadcasts, satellite communications and the like, and more particularly to a structure of a planar antenna suitable to be provided on a window glass of a vehicle. The present invention furthermore relates to a method for designing such a planar antenna.

## BACKGROUND ART

As a circularly polarized wave antenna for a microwave band used in satellite broadcasts, satellite communications and the like, a micro strip antenna (MSA) is prevailing, which is a planar antenna that includes a radiating element on the surface of a dielectric substrate and a ground conductor on the back thereof.

In FIG. 1, there is shown one example of the MSA, Reference numeral 10 denotes a dielectric substrate, 12 an almost square radiating element, and 14 a ground conductor. Where such MSA is provided on a window glass of a vehicle, the dielectric substrate 10 is structured by the window glass of a vehicle, the radiating element is patterned on the outer surface of the window glass, and the ground conductor is patterned on the inner surface of the window glass. Feeder lines are connected to the radiating element and ground conductor, respectively, but the feeder line to the radiating element has to be provided passing through the window glass, which is hard for the vehicle window glass. Consequently, it is difficult to form the MSA on the window glass of a vehicle.

## DISCLOSURE OF THE INVENTION

An object of the present invention is to avoid the problem as described above and provide a circularly polarized wave planar antenna of a coplanar type, which may be formed on one side of a dielectric substrate.

Another object of the present invention is to provide a method